

when attending the “mules” and trotting backward and forward to tie the threads which were constantly breaking? The problem was one in probabilities, and Mr. Woolhouse’s aid was asked by Lord Ashley. He went down to Manchester to obtain his data, and solved the problem, showing that the thread-tying girls ran upwards of thirty miles a day.

In 1858 a public dinner was given to Mr. Woolhouse by his fellow-townsmen of North Shields; and Mr. Dodd, the headmaster of his old school, pronounced a eulogium upon him “as a man and a mathematician.”

Mr. Woolhouse was an accomplished musician and editor of classical music. Only a few days before his death his name appeared in the *Times* as the arranger of a new issue of works by Hummel, and he was the author of a work on “Musical Intervals, containing an investigation of the temperament of the musical scale, and of the beats of imperfect concords.” He also wrote a valuable work on the “Measures, Weights, and Coins of all Nations, and on the Measure of Time,” and several mathematical text-books of great excellence.

Those who knew him unite in testifying to the charm of his character—simple and genial to a degree. Towards the close of his life he was very fond of needlework, which he reduced to an exact science, having formulæ for the constituent parts of the articles he made—even for the exact length of cotton to be used in each operation. His friends love to recall a verbal quip in which he used to delight—“What sum of money is the double of itself? One and tenpence, because it is two and twentypence.” He lived to the age of $84\frac{1}{2}$, and died in 1893 August.

He was elected a Fellow on 1836 May 13, but contributed no papers to the Society.

H. H. T.

Dr. RUDOLF WOLF, the Director of the Observatory at Zurich, died on 1893 December 6, at the age of 77, after a few days’ illness. Dr. Wolf was born 1816 July 7, at Fällanden, near Zurich, and first studied astronomy in the Zurich High Schools, and later at the Universities of Vienna and Berlin. He did not devote himself entirely to the pursuit of astronomy until 1847, when he was appointed Director of the Observatory at Berne. In this small observatory he began the researches on Sun-spot phenomena, with which his name will be most intimately associated in future years. These observations he continuously carried on until his death, and his most important conclusions may be briefly summarised. On 1852 July 31, he showed the intimate connection between the periods of Sun-spot activity and of Earth-magnetism. These results were published simultaneously with, but independently of, those of Professor Lamont, of the Munich Observatory, and of Sabine and Gautier. Lamont and Sabine found a period of about 10 or $10\frac{1}{3}$ years. Professor Wolf showed that this period might be more accurately repre-

sented by 11.11 years, and suggested also a longer period of 55.5 years. He also pointed out that there were considerable deviations from the mean period of 11.11 years, and that the difference in time between two maxima was shortest when their intensities were most marked. He clearly showed the resemblance between Sun-spot curves and those of the variation of light of stars. He collected much evidence connecting the manifestations of auroræ and other luminous phenomena with solar disturbances. Professor Wolf remained at Berne until 1864, when he returned to Zurich as Professor of Astronomy in the Polytechnic, and Director of the Observatory. Dr. Wolf's other contributions to astronomy embrace both pure mathematics and astronomical literature. In 1852 he published the first edition of his *Mathematics, Physics, Geodesy, and Astronomy*, the sixth edition of which was brought out very shortly before his death. In 1858–1861 he wrote four volumes of the *Biographies of Swiss Men of Science*. Two volumes of the *Handbuch der Mathematik* appeared in the years succeeding 1869, followed in 1893 by his *Handbuch der Astronomie, ihrer Geschichte und Litteratur*; his *History of Recent Astronomy* was published in 1877. The *Astronomische Mittheilungen* have continued from 1856 to the present date, and contain descriptions of instruments and scientific relics in the Zurich Observatory, and histories of Swiss mathematicians, physicists and astronomers, as well as important astronomical communications.

Professor Wolf was elected a Foreign Associate of this Society 1864 November 11.

FABIAN JACOB, Baron Wrede of Elima, was born 1802 October 9, and died 1893 May 22. The Barony dates from 1605, when an ancestor saved the life of the King of Sweden, at the expense of his own, at the Battle of Kirkholm. The late Baron showed almost in infancy a decided preference for mechanical and scientific pursuits, but his studies in this direction were interrupted for several years by a military education. After completing this successfully, however, he received a staff appointment at Stockholm, and was again free to study science, though at the expense of some banter from his military companions, to whom the spectacle of a "grown man *reading* in the middle of the day" was quite novel. He was fortunate enough to make the acquaintance of the chemist Berzelius, who delivered a course of lectures at Stockholm in 1820, and a firm friendship sprang up between the two which was only terminated by the death of Berzelius. He was fond of music and literature, and thoroughly enjoyed the opportunities he had in Stockholm of developing these tastes. He was a Fellow, and at one time President, of the Royal Musical Academy of Sweden, and he was privileged to hear read before publication many of the works of his cousin, Miss Bremer, the famous Swedish novelist. But he did not neglect his military career, and his scientific attain-